#5

Title: Forwarding Load Data to Younger Instructions In Annex
Inventor(s): Sharada Yeluri
Atty. Docket No.: SP-5106 US

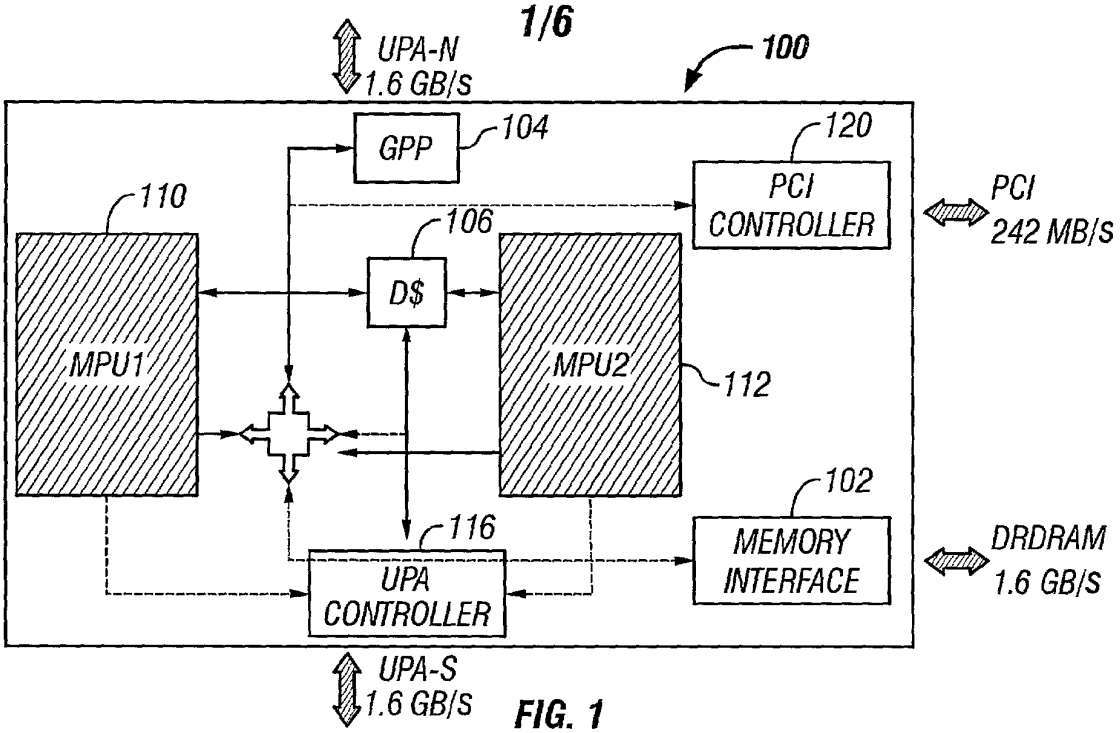

FIG. 1

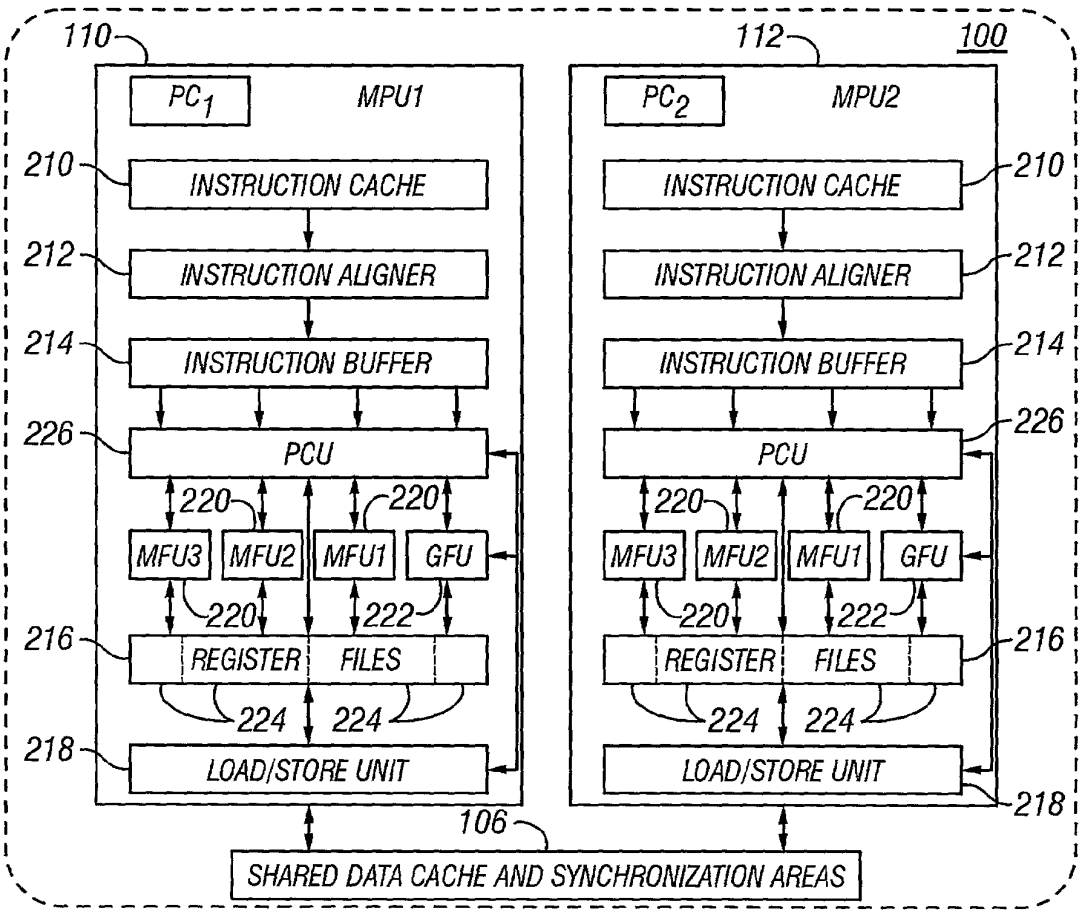

FIG. 2

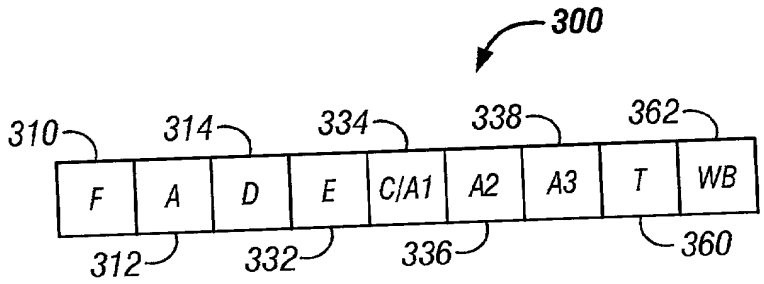
300
310
314
334
338
362
F
A
D
E
C/A1
A2
A3
T
WB
312
332
336
360

FIG. 3

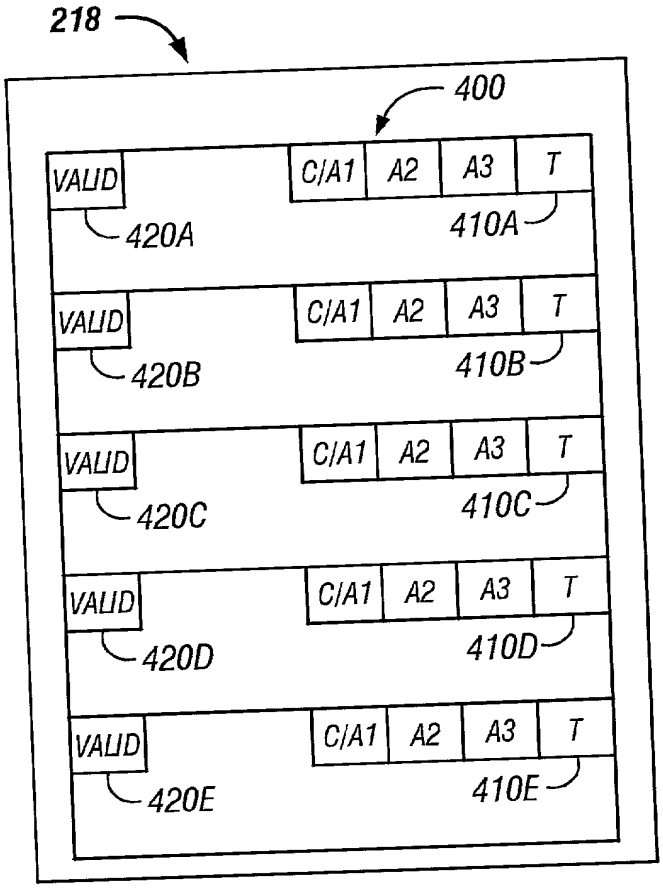
218
400
VALID
C/A1
A2
A3
T
420A
410A
420B
410B
420C
410C
420D
410D
420E
410E

FIG. 4

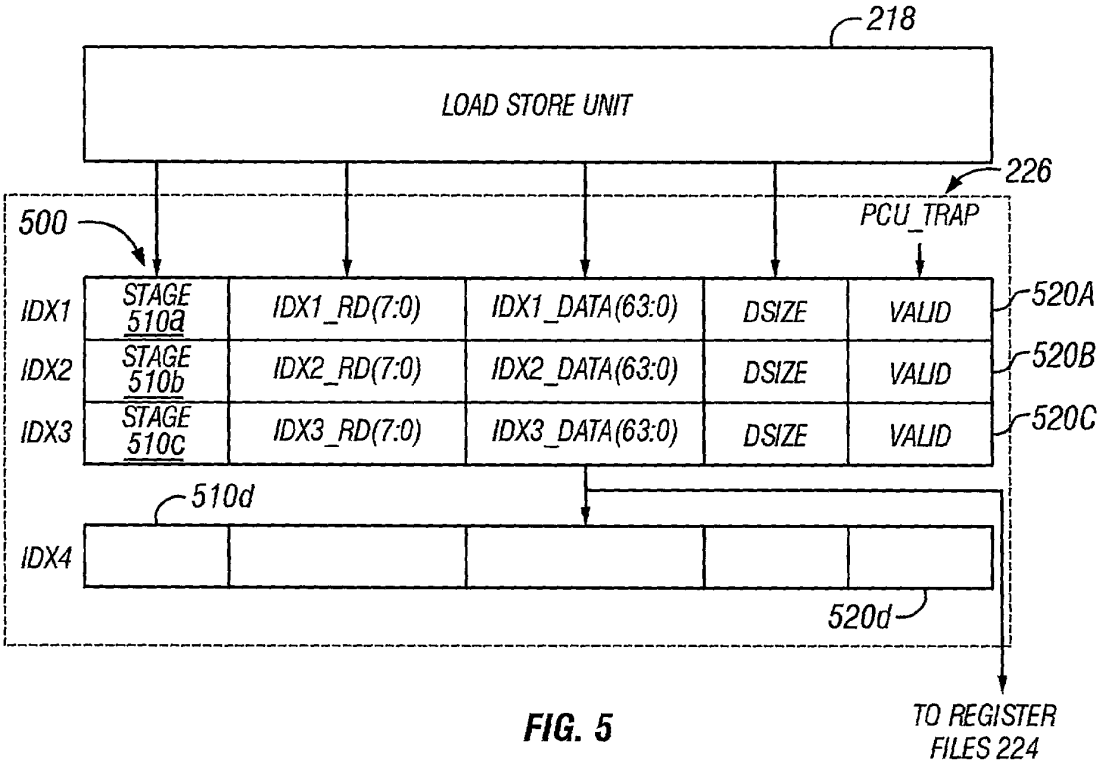
218
LOAD STORE UNIT
226
PCU_TRAP
500
IDX1
STAGE 510a
IDX1_RD(7:0)
IDX1_DATA(63:0)
DSIZE
VALID
520A
IDX2
STAGE 510b
IDX2_RD(7:0)
IDX2_DATA(63:0)
DSIZE
VALID
520B
IDX3
STAGE 510c
IDX3_RD(7:0)
IDX3_DATA(63:0)
DSIZE
VALID
520C
510d
IDX4
520d
TO REGISTER FILES 224

FIG. 5

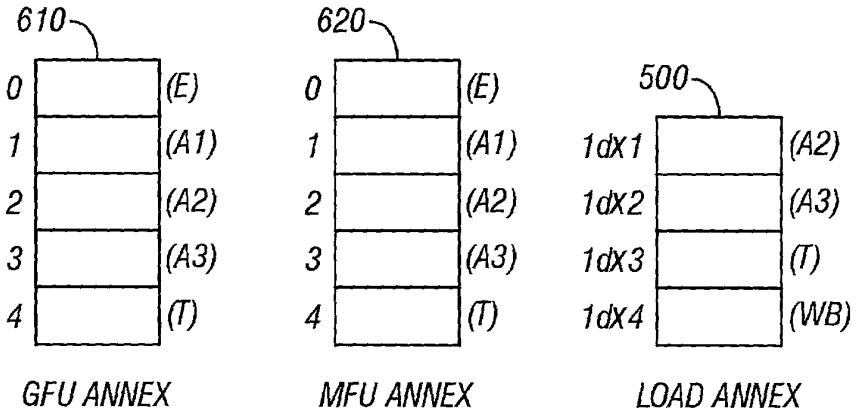
610
0 (E)
1 (A1)
2 (A2)
3 (A3)
4 (T)
GFU ANNEX
620
0 (E)
1 (A1)
2 (A2)
3 (A3)
4 (T)
MFU ANNEX
500
1dX1 (A2)
1dX2 (A3)
1dX3 (T)
1dX4 (WB)
LOAD ANNEX

FIG. 6

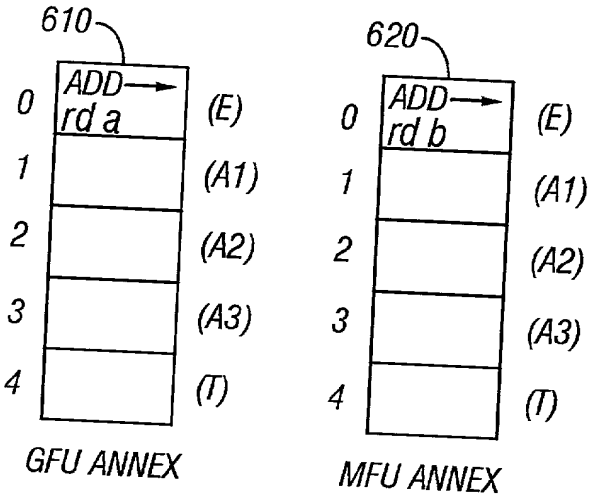
610
620
ADD rd a
ADD rd b
0
1
2
3
4
(E)
(A1)
(A2)
(A3)
(T)
GFU ANNEX
MFU ANNEX

FIG. 7

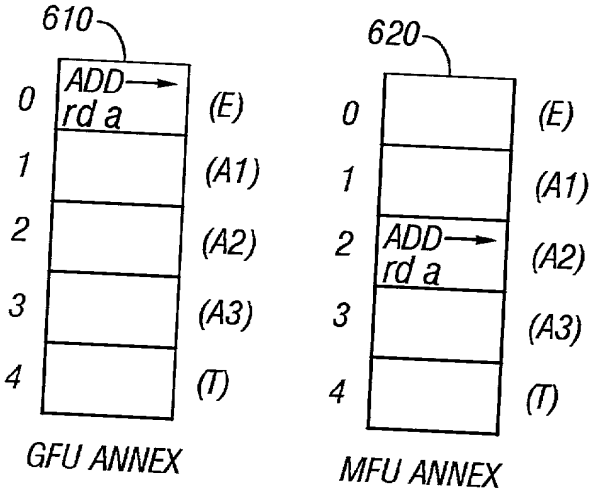
610
620
ADD rd a
ADD rd a
0
1
2
3
4
(E)
(A1)
(A2)
(A3)
(T)
GFU ANNEX
MFU ANNEX

FIG. 8

CYCLE	1	2	3	4	5	6	7	8	9	10	11	12
(1)	D	E	C/A1	A2 (ldX1)	A3 (ldX2)	T (ldX3)	WB (ldX4)					
(2)		D	D	D	E	A1	A2	A3	T	WB		
(3)					D	E	A1	A2	A3	T	WB	
(4)						D	E	A1	A2	A3	T	WB
(5)							D					

FIG. 9

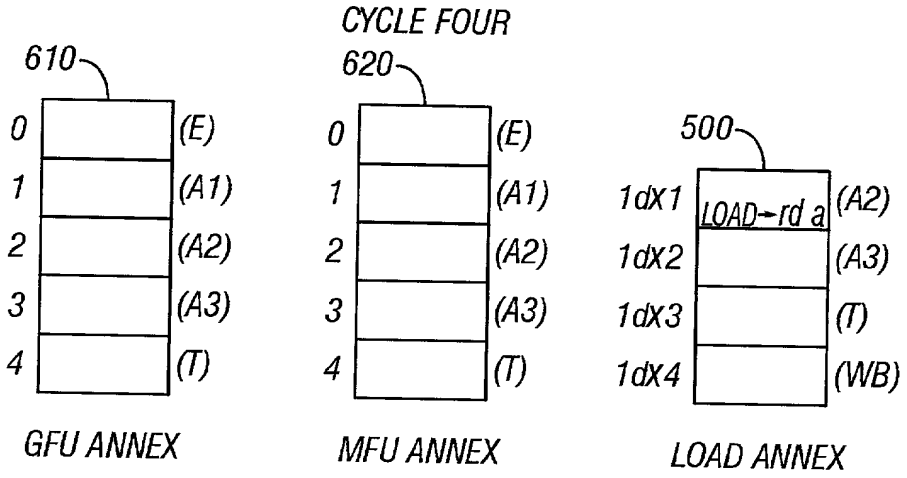

FIG. 10

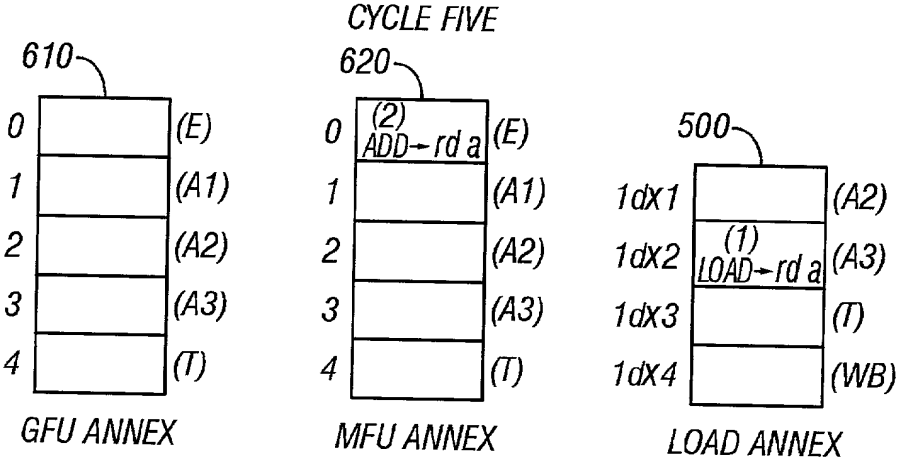

FIG. 11

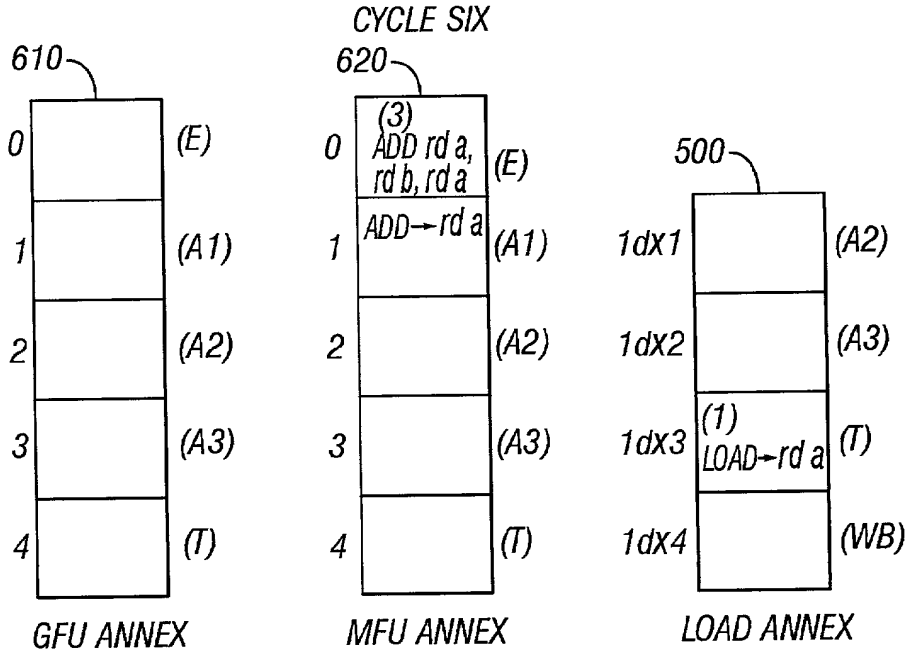
CYCLE SIX
610
620
500
0
1
2
3
4
(E)
(A1)
(A2)
(A3)
(T)
(3)
ADD rd a, rd b, rd a
ADD→rd a
1dx1
1dx2
1dx3
1dx4
(1)
LOAD→rd a
(WB)
GFU ANNEX
MFU ANNEX
LOAD ANNEX

FIG. 12

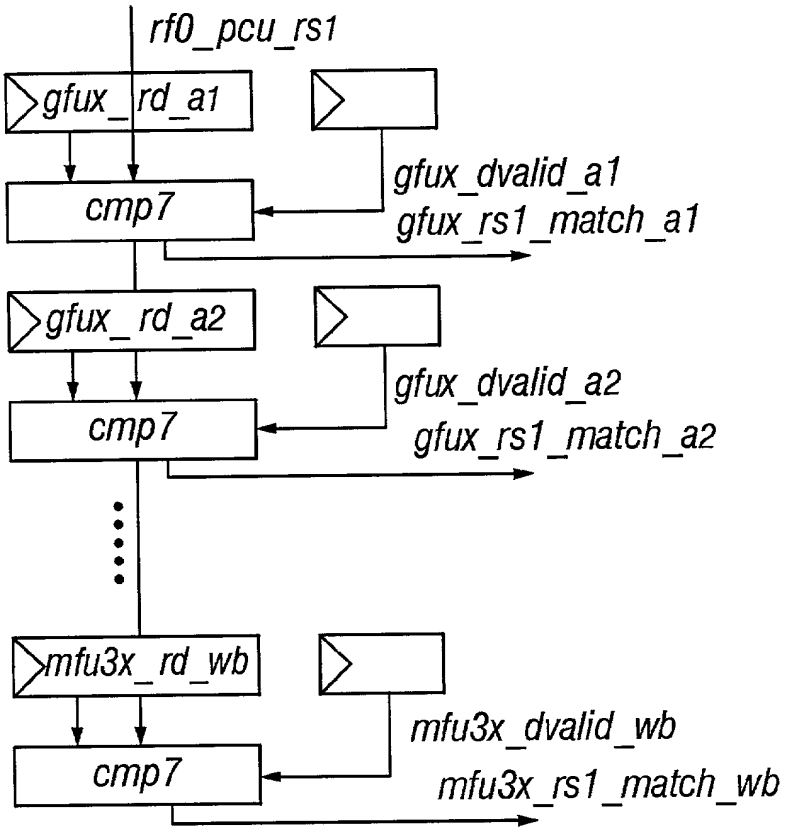
rf0_pcu_rs1
gfux_rd_a1
cmp7
gfux_dvalid_a1
gfux_rs1_match_a1
gfux_rd_a2
cmp7
gfux_dvalid_a2
gfux_rs1_match_a2
mfu3x_rd_wb
cmp7
mfu3x_dvalid_wb
mfu3x_rs1_match_wb

FIG. 13